Trend Study 18-20-02

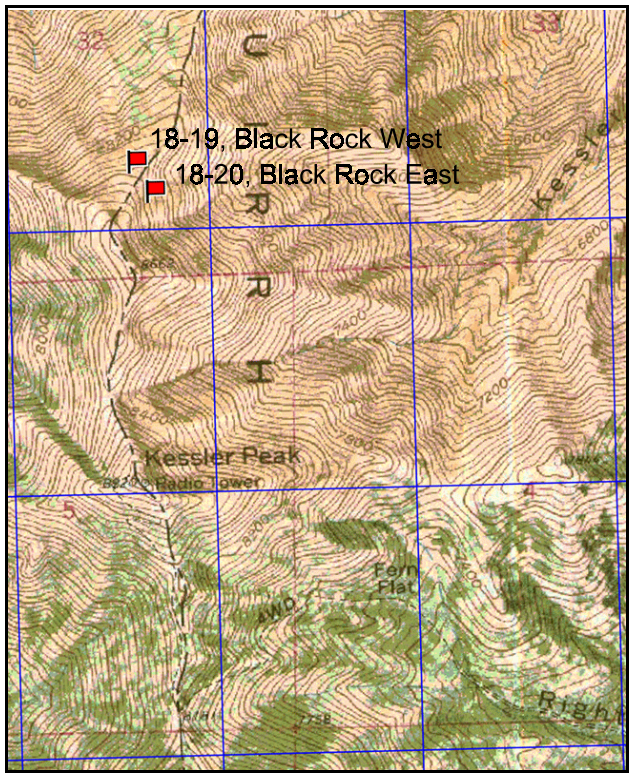
Study site name: Black Rock East . Vegetation type: Perennial Grass .

Compass bearing: frequency baseline 35 degrees magnetic (Line 3-4 @ 336°M).

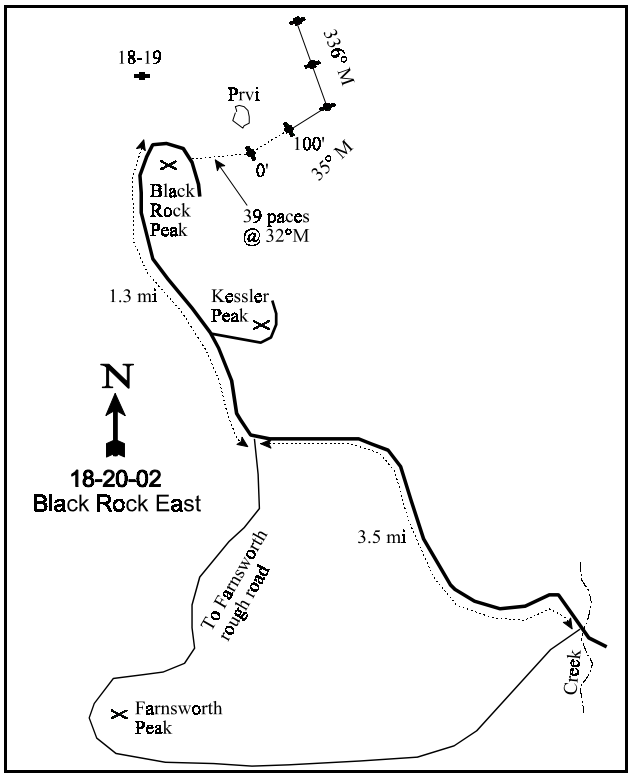
Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

Traveling north on Highway #111 turn left (West) (just before the Baccus west gate sign and overpass) on a dirt road which goes up Coon Canyon. Travel west for 0.2 miles to a gate. This gate (#39E) is controlled by Kennecott and you must get permission to have it opened. Contact Paula at the Kennecott Environmental Office (569-7120) before reading the site. From the gate continue up Coon Canyon for 3.9 miles to a fork. Turn right (north) off the main road and travel north west up the right fork of Coon Canyon for 3.5 miles to a saddle and an intersection. Stay right and continue 1.3 miles up a steep road around the west side of Kessler Peak to last switchback west of Black Rock Peak. Park here and walk onto the knoll to the east. From the knoll, walk 39 paces north (bearing approximately 32 degrees magnetic) to the 0-foot baseline stake. The study is marked by short fenceposts. The 100-foot end of the baseline is marked by rebar.



Map Name: Farnsworth Peak



Diagrammatic Sketch

Township 1S , Range 3W , Section 32

GPS: NAD 27, UTM 12S 4504129 N 398339 E

DISCUSSION

Black Rock East - Trend Study No. 18-20

The Black Rock East study is at about the same elevation as the Black Rock West study (18-19). This site has a moderate slope of 35% and a northeast aspect. In 1997, it was noted that the site had been poorly located as it was placed on the ecotone between a thick stand of spike fescue and the noticeably drier eastern aspect dominated by needlegrass and slender wheatgrass. It was suggested that the site should be moved further to the north where elk pellet groups indicated that elk preferred the spike fescue, not the more dry east aspect. A pellet group transect read on site in 1997 estimated 48 elk days use/acre (119 edu/ha), but there were no deer pellets sampled. Pellet group data from 2002 estimated 64 elk days use/acre (159 edu/ha), while deer use was estimated at only 3 days use/acre (7 ddu/ha). Grasshoppers were common on the site in 2002.

The soils at the site are moderately deep with an effective rooting depth of almost 16 inches. The soil temperature was estimated at 50° F at 17 inches in depth. The soil textural analysis indicates a loam with a slightly acidic soil reaction (pH 6.4) The site has good protective herbaceous and litter cover, with little erosion taking place. The erosion condition class was determined as stable in 2002.

The Black Rock East site in the Smelter Canyon drainage was described as drier and originally more depleted of vegetation than the study in the Black Rock Canyon drainage. The community here is similar to the Black Rock West site in that spike fescue is also the dominant grass. There are few shrubs on the site with the most common species being isolated dense patches of chokecherry. There are also a few stickyleaf low rabbitbrush and snowberry shrubs on the slope. Total shrub cover is very low averaging only about 6% cover in 2002.

The herbaceous understory is abundant and very diverse. Spike fescue provided 75% of the total grass cover in 1997 and 37% of the total herbaceous cover. By 2002, it accounted for 81% of the grass cover and 47% of the total herbaceous cover. Several other perennial grasses occur on the site but only letterman and subalpine needlegrass are common. Grasshoppers were in very high numbers in 1997 and 2002 and were utilizing the grasses. The forb composition is very diverse with 23 species sampled in 2002. The more common perennial species include western yarrow, rose pussytoes, aster, lupine, and showy goldeneye.

1990 APPARENT TREND ASSESSMENT

The soil trend is thought to be stable with good protective cover from the herbaceous species and litter. The browse trend is not critical to this site because of the elevation. It is more of a summer range for elk. Although, the species that do occur on the site are generally in good vigor even though the sampling design did not pick up any shrubs. The herbaceous understory is thought to be in stable condition with most of the vegetative cover coming from the herbaceous species.

1997 TREND ASSESSMENT

The trend for soil is stable. Cover values for percent bare soil declined to 6%, but litter cover also declined. Protective cover from the herbaceous species is still high with 92% of the total vegetative cover coming from grasses and forbs. The much larger sampling design now picks up some browse species that were not sampled before. The numbers are relatively low and shrubs are still a minor component of the vegetative community. Trend is stable for the herbaceous species with similar sum of nested frequency values for grasses and forbs compared to 1997.

TREND ASSESSMENT
soil - stable (3)
browse - stable, but not a critical on this summer range (3)
herbaceous understory - stable (3)

2002 TREND ASSESSMENT

Trend for soil remains stable. Cover of bare ground did increase slightly while litter cover declined slightly. However, total herbaceous cover remained stable at about 45%. There is still adequate protective ground cover to prevent most erosion. There is little browse on the site which is of minor importance on this summer range. One thick patch of chokecherry located near the beginning of the baseline accounts for most of the shrub density. Trend for the herbaceous understory is stable. Sum of nested frequency for perennial grasses and forbs has remained stable. Spike fescue continues to dominate the site with subalpine and letterman needlegrass more common on the drier eastern aspect of the slope.

TREND ASSESSMENT
soil - stable (3)
browse - stable, but not a critical (3)
herbaceous understory - stable (3)

HERBACEOUS TRENDS --
Herd unit 18 , Study no: 20

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'90	'97	'02	'90	'97	'02	'97	'02
G	Agropyron spicatum	3	10	4	1	5	2	.19	.03
G	Agropyron trachycaulum	a157	b91	a26	66	41	12	.90	.24
G	Bromus carinatus	b102	a8	a22	47	4	7	.22	.66
G	Leucopoa kingii	a21	b153	b163	9	49	49	17.10	20.87
G	Melica bulbosa	4	1	-	1	1	-	.00	-
G	Poa bulbosa	-	1	-	-	1	-	.00	-
G	Poa fendleriana	-	1	11	-	1	4	.03	.04
G	Poa pratensis	2	5	3	1	2	1	.01	.03
G	Poa secunda	a-	a1	b15	-	1	7	.00	.13
G	Stipa columbiana	a16	ab36	b43	8	18	24	1.09	.53
G	Stipa lettermani	121	128	111	52	56	43	3.22	3.17
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		426	435	398	185	179	149	22.79	25.74
Total for Grasses		426	435	398	185	179	149	22.79	25.74
F	Achillea millefolium	97	109	132	45	42	50	2.79	1.88
F	Agoseris glauca	b26	ab11	a5	11	5	2	.02	.01
F	Agastache urticifolia	a-	a7	b22	-	3	11	.04	.25
F	Antennaria rosea	a-	b51	b45	-	17	18	4.00	3.40
F	Arabis spp.	13	9	8	7	5	5	.02	.02
F	Aster spp.	A-	b18	c44	-	9	21	.43	.93
F	Chaenactis douglasii	b21	a1	a-	10	1	-	.00	-
F	Cirsium spp.	A-	b7	a-	-	5	-	.36	.00
F	Comandra pallida	-	-	-	-	-	-	-	.00
F	Collinsia parviflora (a)	-	a-	b10	-	-	6	-	.03
F	Crepis acuminata	b19	a-	a-	8	-	-	-	-

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'90	'97	'02	'90	'97	'02	'97	'02
F	Delphinium nuttallianum	5	3	1	3	3	1	.06	.03
F	Epilobium brachycarpum (a)	-	10	7	-	4	2	.07	.01
F	Eriogonum umbellatum	-	6	6	-	2	2	.15	.03
F	Erysimum spp.	9	-	-	4	-	-	-	-
F	Gayophytum ramosissimum (a)	-	$_{b}$95	$_{a}$1	-	33	1	2.12	.01
F	Helianthus annuus (a)	1	-	-	1	-	-	-	-
F	Helianthella uniflora	$_{b}$16	$_{a}$-	$_{a}$-	6	-	-	-	-
F	Lathyrus brachycalyx	9	17	14	5	6	6	1.24	.60
F	Lactuca serriola	4	-	-	3	-	-	-	-
F	Linaria dalmatica	-	-	1	-	-	1	-	.16
F	Lupinus argenteus	$_{b}$68	$_{a}$31	$_{b}$49	26	14	22	2.46	3.95
F	Machaeranthera canescens	1	7	7	1	4	3	.07	.04
F	Madia glomerata (a)	-	-	5	-	-	3	-	.04
F	Osmorhiza occidentalis	$_{b}$12	$_{a}$-	$_{a}$-	6	-	-	-	-
F	Penstemon spp.	$_{A}$-	$_{b}$13	$_{a}$-	-	7	-	.11	-
F	Polygonum douglasii (a)	-	$_{b}$209	$_{a}$159	-	61	49	5.67	1.72
F	Potentilla spp.	-	4	-	-	2	-	.03	-
F	Stellaria jamesiana	$_{a}$-	$_{c}$121	$_{b}$25	-	45	9	1.61	.07
F	Taraxacum officinale	-	5	-	-	2	-	.15	-
F	Thalictrum fendleri	8	3	7	3	1	3	.15	.18
F	Tragopogon dubius	$_{b}$13	$_{a}$1	$_{ab}$2	7	1	2	.00	.01
F	Unknown forb-perennial	-	5	-	-	3	-	.09	-
F	Viguiera multiflora	$_{b}$197	$_{a}$80	$_{b}$176	76	33	57	1.33	5.66
F	Viola spp.	-	2	-	-	1	-	.03	-
Total for Annual Forbs		1	314	182	1	98	61	7.87	1.81
Total for Perennial Forbs		518	511	544	221	211	213	15.23	17.27
Total for Forbs		519	825	726	222	309	274	23.11	19.09

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Herd unit 18 , Study no: 20

Type	Species	Strip Frequency		Average Cover %	
		'97	'02	'97	'02
B	Chrysothamnus viscidiflorus viscidiflorus	0	2	-	.03
B	Prunus virginiana	12	13	4.06	5.65
B	Symphoricarpos oreophilus	1	1	.15	-
Total for Browse		13	16	4.21	5.69

CANOPY COVER -- LINE INTERCEPT
Herd unit 18 , Study no: 20

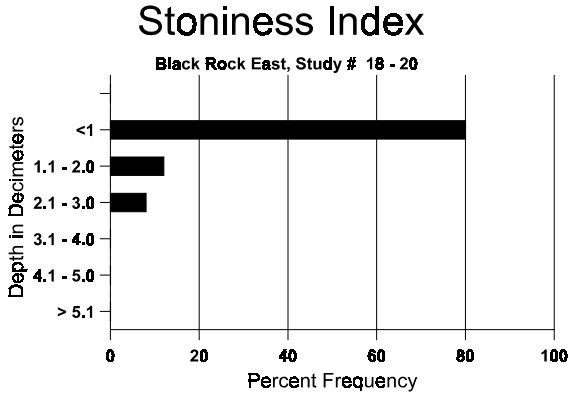
Species	Percent Cover	
	'97	'02
Prunus virginiana	-	5.80

BASIC COVER --
Herd unit 18 , Study no: 20

Cover Type	Nested Frequency		Average Cover %		
	'97	'02	'90	'97	'02
Vegetation	368	376	7.75	55.12	54.47
Rock	217	220	11.75	6.25	8.47
Pavement	291	240	16.00	14.37	8.39
Litter	396	378	51.50	42.15	36.38
Cryptogams	-	5	.25	0	.01
Bare Ground	181	216	12.75	5.88	9.26

SOIL ANALYSIS DATA --
Herd Unit 18, Study no: 20, Black Rock East

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
15.7	50.0 (17.4)	6.4	36.4	46.1	17.5	8.9	43.9	252.8	0.4



PELLET GROUP FREQUENCY --
Herd unit 18, Study no: 20

Type	Quadrat Frequency	
	'97	'02
Elk	21	25
Deer	-	2

Pellet Transect			
Pellet Groups per Acre		Days Use per Acre (ha)	
'97	'02	'97	'02
626	835	48 (119)	64 (159)
-	35	-	3 (7)

BROWSE CHARACTERISTICS --
Herd unit 18 , Study no: 20

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus viscidiflorus																		
M	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	02	2	-	-	-	-	-	-	-	-	2	-	-	-	40	9	12	2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'90	00%	00%	00%	
'97	00%	00%	00%	
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'90	0	Dec:	-
	'97	0		-
	'02	40		-

Prunus virginiana																		
Y	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	52	-	-	-	-	-	-	-	-	52	-	-	-	1040			52
	02	380	-	-	-	-	-	-	-	-	380	-	-	-	9240			462
M	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	51	2	-	-	-	-	-	-	-	53	-	-	-	1060	30	14	53
	02	23	1	-	-	-	-	-	-	-	23	1	-	-	480	34	19	24
D	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	1	-	-	-	-	-	-	-	-	-	-	1	20			1
	02	12	-	-	-	-	-	-	-	-	4	-	-	8	240			12
X	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	140			7
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	160			8

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'90	00%	00%	00%	
'97	03%	00%	.94%	+79%
'02	.20%	00%	02%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'90	0	Dec:	0%
	'97	2120		1%
	'02	9960		2%

Symphoricarpos oreophilus																		
Y	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20	7	5	1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'90	00%	00%	00%	
'97	00%	00%	00%	+ 0%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'90	0	Dec:	-
	'97	20		-
	'02	20		-